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IN THE APPLICATION
OF
RICHARD AGAN
FOR A
TRUCK BED EXTENSION

TRUCK BED EXTENSION

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/454,355, filed March 14, 2003.

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention is directed to a truck-bed extension adapted to fit directly to a truck. More particularly, the invention is a truck-bed extension that can be easily assembled and disassembled by a single person.

2. DESCRIPTION OF THE RELATED ART

Generally, truck-bed extensions that attach directly to a trailer receiver are of limited size thus limiting what can be carried to but a few items, such as a couple of bicycles. A large truck-bed extension that can be easily assembled and disassembled by a truck driver, and stored on the back of a truck is unknown; as is an easily assembled and disassembled

large truck-bed extension that can be easily adapted to provide a mobile work surface, such as a craft work surface, or a family eating table is also not known.

Several efforts have been made to address these and other problems. U.S. Patent No. 4,695,218 issued September 22, 1987 to E.W. Boyer, describes a carrier attachment for engaging a trailer hitch tailstock of a motor vehicle includes a tube segment supporting an electrical motor. The '218 carrier attachment requires an electric motor and is not suitable for easy assembly or disassembly by an ordinary truck driver.

U.S. Patent No. 4,813,584 issued March 21, 1989 to M.D. Wiley, describes a cargo carrier that attaches to a trailer hitch. While the cargo carrier is connected solely to the hitch, it is of limited size and is purchased as one piece. Thus, it is not easy to store in a box of limited dimensions and is not capable of easy assembly or disassembly and storage by e.g. a pickup truck driver. Thus, there is a need for a cargo carrier that is large enough to carry several items, and can be taken apart by a person and stored in a truck box for easy carriage on the vehicle when not in use.

U.S. Patent No. 5,938,092 issued August 17, 1999 to B.K. Johnson, describes a continuously curved drawbar adapted to be

mounted in a receiver hitch for extending the bed of a transport vehicle and linked to L-shaped arms for carrying extended length loads. However, the '092 drawbar is entirely unsuitable for carrying e.g. a board or items that lack sufficient length to traverse the distance between the back of a truck and the L-shaped arms.

Other patents showing truck-bed extensions or cargo carriers, but which do not suggest a truck-bed extension according to the claimed invention, include U.S. Patent Nos. 1,641,502 (Price), 3,650,443 (Haskett et al.), 3,724,694 (Wilson), 4,234,284 (Hauff), 4,906,015 (LaCroix et al.), 4,915,276 (Devito), 4,950,123 (Brockhaus), 4,951,991 (Haigler), 4,971,509 (Sechovec et al.), 4,989,765 (Huebner), 5,038,983 (Tomososki), 5,067,640 (Gaskill), 5,224,636 (Bounds), 5,397,147 (Ducharme et al.), 5,423,566 (Warrington et al.), 5,427,289 (Ostor), 5,451,088 (Broad), 5,458,389 (Young), 5,560,666 (Vieira et al.), 5,586,702 (Sadler), 5,615,813 (Ouellette), 5,678,743 (Johnson et al.), 5,752,636 (Manley), 5,820,004 (Lane), 5,950,890 (Darby), 6,050,627 (Lee), 6,155,623 (Lane), 6,213,492 B1 (Ceccarelli, III), 6,237,824 (Bagley), and 6,345,749 B1 (Hamilton).

Foreign patents showing truck-bed extensions or cargo carriers, but which do not suggest a truck-bed extension according to the claimed invention, include United Kingdom Patent No. GB 2,235,668 A, and Canadian Patent Nos. 1,304,107 and 2,153,029.

None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed. Thus a truck-bed extension solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

A truck-bed extension adapted to attach to a truck with a truck gate and a hitch receiver. The truck-bed extension attaches to the truck hitch receiver without obstructing the gate regardless of the open or closed position of the gate. The truck-bed extension is also adapted for easy disassembly and assembly by a single person. The truck-bed extension is also adapted to serve as a mobile work surface, such as a craftwork surface.

It is an object of the invention to provide a truck-bed extension that attaches to a trailer receiver

It is another object of the invention to provide a truck-bed extension that is of sufficient size to carry a number of different items such as hay, tools, fertilizer, and bicycles.

It is still another object of the invention to provide a truck-bed extension with a flat support for such activities as handyman work and family eating.

It is a further object of the invention to provide a truck-bed extension that is easily assembled and dissembled by a single person.

It is a further object of the invention to provide a truck-bed extension that is easily stored in a dissembled form.

It is an object of the invention to provide improved elements and arrangements thereof for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an environmental perspective view of a truck-bed extension according to the invention.

Fig. 2 is an exploded view of the truck-bed extension of Fig. 1.

Fig. 3A is a side view of the truck-bed extension of Fig. 1 with a hinge joint.

Fig. 3B is a side view of the truck-bed extension of Fig. 1 with a detachable telescopic connection.

Fig. 4 is a top view of the truck-bed extension of Fig. 1.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is directed to a truck-bed extension 50 adapted to fit directly to a truck 60. More particularly, the invention is directed to a truck-bed extension 50 comprised primarily of sections of crafted tubing that can be assembled and disassembled by a single person 70. The terms "a single

person" and "truck operator" are hereinafter regarded as equivalent terms.

Fig. 1 shows an environmental perspective view of the truck-bed extension 50 attached to a truck 60, and more particularly to the truck's hitch receiver 68. The truck-bed extension 50 of the invention functions as an extension of the truck's bed 65. The truck 60 has a gate 80 pivotally attached to the rear end 90 of the truck 60. In common with other truck gates, the gate 80 is moveable between an open and closed position. The truck-bed extension 50 is adapted to avoid contact with the gate 80 regardless of the open or closed position of the gate 80. Thus, when the gate 80 is open items of greater length than the truck-bed 65 can be carried by laying them flat along the truck-bed 65, opened gate and truck-bed extension 50. Conversely, when the gate 80 is closed items can be carried on the truck-bed extension 50 independent from the truck-bed 65.

Optional retractable legs 75a and 75b may be attached to the truck-bed extension as shown in Figs. 1, 3A and 3B. The retractable legs 75a and 75b should only be deployed when the truck 60 is stationary. The addition of the optional retractable legs 75a and 75b add stability and enable the truck-

bed extension 50 to be used, for example, as a stable platform or work top when the truck 60 is stationary.

With reference to Fig. 2, in general terms, the truck-bed extension 50 comprises a first support member 110 attached to a second support member 210 and a first T-bar 180, a rear support member 250 attached to the second support member 210, a first side support bar 320a and second side support bar 320b connecting the opposite ends 182a and 182b of the first T-bar 180 respectively with the opposite ends 300 and 310 of the rear support member 250, with a first cross-bar 380 and second cross-bar 385 connected to the side support bars 320a and 320b. Optional side railings 350a and 350b are removably attached to the ends of the T-bar 180 and rear support member 250.

The truck-bed extension 50 is attached to a truck hitch receiver 68 located on the underside of the rear end 90 of truck 60. More specifically, the truck-bed extension 50 comprises an elongated first support member 110 with first 120 and second 130 opposite ends. The first support member 110 further comprises a lower segment 140, an upper segment 150, and truss framework 155. The truss framework 155 joins the lower segment 140 to the upper segment 150 as shown in Fig. 2.

The lower 140 and upper 150 segments are generally lengths of tubing of sufficient gauge to resist e.g. lateral, vertical and twisting forces. However, the truck-bed extension 50 may comprise of one or more solid sections to give additional strength, particularly where large loads or heavy loads are to be carried on the truck-bed extension 50. The tubing is preferably of square cross-section, but may be made of circular cross-section. The tubing is preferably made of steel or any alloy of sufficient strength to carry loads up to a predetermined amount safely. However, it should be understood that the exact form of the tubing used in the first support member 110, and in any other part of the bed-extension of the present invention, may vary without detracting from the spirit of the invention.

Still referring to Fig. 2, the lower segment 140 has the first opposite end 120 wherein the first opposite end 120 defines a first attachment point 160. The upper segment 150 comprises the second opposite end 130 that in turn defines a second attachment point 170. The second attachment point 170 is adapted to receive a second support member 210. In the preferred embodiment, the second attachment point 170 comprises a first half 171a of hinged joint 172; a joint bolt 173; the

joint bolt is ultimately secured to the second support member 210 (and more particularly to the second half 171b of the hinged joint 172) using a nut 173a. The upper segment 150 further comprises a first T-bar attachment point 175a; the first T-bar attachment point 175a may take a male or female form and likewise with regard to every attachment point described herein which can take a male or female form.

The first attachment point 160 of the first support member is secured to the truck hitch point 68 using a hitch bolt 105. The lower segment 140 is of sufficient length to ensure a clearance between the gate 80 (especially when open) and the upper segment 150 of the first support member 110 thereby ensuring that the truck-bed extension 50 can be used when the gate 80 is closed or open.

The first T-bar 180 has a central attachment point 175b, wherein the central attachment point 175b is adapted to complement the first T-bar attachment point 175a on the upper segment 150 of the first support member 110. A cotter pin 200 or similar device is used to securely connect the first T-bar 180 to the first support member 110 wherein the first T-bar 180 forms a cross above the first support member 110. The T-bar 180 is substantially parallel with and at approximately the same

height as the open gate 80 (see Fig. 1), and preferably parallel with and at the same height as first 380 and second 385 cross-bars. It should be understood that any suitable securing device may be used in place of the cotter pin 200. In addition, while it is important that the attachment points 175a and 175b complement each other, either attachment point can be female or male. The T-bar 180 further comprises a third 182a and fourth 182b opposite ends, which in turn define the length of the first T-bar 180.

An elongated tubular shaped second support member 210, has a third 220 and fourth 230 opposite ends. The third end 220 comprises a second half 171b of the hinged joint 172, which is secured the first half 171a of the hinged joint 172 using bolt parts 173 and 173a. Thus, the second support member 210 acts as a hinged extension of the first support member 110. The fourth opposite end 230 comprises a second T-bar attachment point 240a adapted to complement a third T-bar attachment point 240b on the rear support member 250; a hitch pin 242 (or any other suitable fastener) is used to secure complementary T-bar attachment points 240a and 240b.

The rear support member 250 has a fifth 260a and sixth 260b opposite ends, and comprises an upper bar 252. The fifth 260a

and sixth 260b opposite ends define the length of the rear support member 250, and more particularly the upper bar 252. The length of the upper bar 252 corresponds to the length of the first T-bar 180 as defined by the distance between its opposite ends 182a and 182b. The rear support member also comprises an integral second T-bar 280 with a second T-bar attachment point 240b that is used to attach the rear support member 250 to the second T-bar attachment point 240a using a cotter pin 285. It should be understood that any suitable securing pin or device might be used in place of the cotter pin 285. The integral T-bar 280 forms a perpendicular horizontal angle with respect to the second support member 210. The opposite ends 260a and 260b respectively comprise a U-bracket 300 and 310, respectively. Optional rear facing lights 290a and 290b are shown attached to the ends 260a and 260b of the rear support member 250.

A first side bar 320a with opposite ends 330a and 330b and a second side support bar 320b with opposite ends 340a and 340b. The first 320a and second 320b side support bars connect the opposite ends 260a and 260b of the rear member 250 respectively to the opposite ends 182a and 182b of the first T-bar 180. The ends 330a and 330b rest on the U-brackets 260a and 260b, respectively, and the opposite ends 340a and 340b are

respectively connected to the T-bar ends 182a and 182b using cotter pins 184a and 184b. Optional side railings 350a and 350b are similarly connected to the T-bar 180 and rear member 250 as shown in Fig. 2. The support bars 320a and 320b further comprise oppositely aligned U-brackets 360a, 360b and 370a, 370b, respectively. A first cross-bar 380 having opposite ends 390a, 390b and a second cross-bar 385 having opposite ends 400a, 400b, respectively, and are connected the support bars 320a and 320b as shown in Fig. 2. Specifically, the opposite ends 390a and 390b of the first cross bar 380 are attached to the U-brackets 360a and 360b; and opposite ends 400a and 400b of the second cross bar 385 are attached to the U-brackets 370a and 370b. Cotter pins 410a, 410b secure the opposite ends 390a, 390b of the cross-bar 380 to support bars 320a and 320b, respectively and cotter pins 420a, 420b secure opposite ends 400a, 400b of cross-bar 385 to support bars 320a and 320b, respectively.

Referring to Fig. 3A, which shows a side view of the truck-bed extension 50 of Fig. 1 with a hinge joint 172. The hinge joint 172 comprises a first half 171a and second half 171b that are welded to the respective ends 130 and 220 of the first 110 and second 210 support members. In normal operation, the

support members 110 and 210 are held together by the joint bolt 173 (and nut 173a). When the truck-bed extension 50 is not in use, the members 110 and 210 can be folded with respect to each other thus reducing the length of the storage space required to store the parts of the truck-bed extension 50. As noted earlier, the truck-bed extension 50 can be used without the optional side railings 350a and 350b.

Referring to Fig. 3B, which shows a side view a different embodiment of the invention in the form of a truck-bed extension 50a wherein the hinge joint 172 is not used to connect the support members 110 and 210. In this embodiment, the support members 110 and 210 telescope into each other to provide a rigid and secure connection between the two parts. Either of ends 130a and 220a can act as the male or female member. As should be clear to a person of ordinary skill in the art of engineering, if the member end 130a of member 110 forms the male part then the end 130a should be sized to fit inside the end 220a and visa versa. It obviously follows that in this embodiment of the invention the female member, whether it be the end 130a or 220a, should be hollow and suitably sized to accept the male member (and conversely the complementary male member end should be suitably sized to fit inside the female member).

A connecting pin 174 may be used to keep ends 130a and 220a securely attached to each other. If the connecting pin 174 is used, then the ends 130a and 220a should define appropriate through-holes to accommodate the connecting pin 174. As a general point, it should be understood that the pins used in either embodiment may be replaced with any suitable fastening device.

Fig. 4 shows a top view of the truck-bed extension 50 of Fig. 1. The members 252, 380 and 385 act as the support members of the truck-bed extension 50 of the invention; the members 252, 380 and 385 are preferably at substantially the same elevation as the truck gate 80 (i.e., specifically when the gate 80 is in an open position). A flat board 430 (shown as a dashed line) can be placed on the members 252, 380 and 385 to provide a platform on which to place items for transport such as bales of hay, sacks of fertilizer, gardening or farming implements etc. The flat board 430 may be made of wood, light metal alloy, or any suitable plastic. The flat board 430 may form a permanent part of the truck-bed extension 50. The flat board 430 may also be used as a work platform by a skilled artisan or craftsmen when the truck 60 is stationary, preferably with the optional retractable legs 75a and 75b fully deployed. Other items such

as cycles and large toys may be laid flat and tied directly to the members 252, 380 and 385, or on the optional board 430. Thus, it should be clear that the truck-bed extension 50 may be used in a number of different ways. It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.